

REMARKS

I. Status Summary

Claims 1-13 are pending in the present application. Claims 1-3 and 9 have been amended. Therefore, upon entry of this Amendment, Claims 1-13 will be pending. No new matter has been added. Reconsideration of the application as amended and based on the arguments set forth hereinbelow is respectfully requested.

II. Claim Rejections Under 35 U.S.C. § 112

Claims 1-13 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the claimed subject matter. In particular, the Examiner states that there is insufficient antecedent basis for the phrase "the received measurement vectors" in Claim 1 at page 30, line 16. Claim 1 has been amended to delete the word "the" in the phrase. Thus, antecedent basis for the phrase has been corrected.

Further, regarding Claim 1, the Examiner contends that it is unclear whether the phrase "a received measurement vector" at page 30, line 22, is intended to be the same as or different than the phrase "received measurement vector" at page 30, line 16. The Examiner also contends that it is unclear whether the phrase "a corresponding reference vector" at page 30, line 23, is intended to be the same as or different than the phrase "a corresponding reference vector" at page 30, line 18. Applicant respectfully submits that the "received measurement vector" and the

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"corresponding reference vector" recited in element (c) are intended to refer to one of the "received measurement vectors" and one of the "corresponding reference vectors" recited in element (b). Therefore, in order to clarify the intended meaning, element (c) has been amended to replace "a received measurement vector" with "one of the received measurement vectors" and to replace "a corresponding reference vector" with "one of the corresponding reference vectors". Accordingly, applicant respectfully submits that the meanings of these element (c) phrases have been clarified.

Regarding Claim 3, the Examiner contends that it is unclear whether the phrase "a next measurement vector" at page 32, line 28, is intended to be the same as or different from the phrase "the next measurement vector" at page 31, line 31. The phrases are intended to refer to possibly different next measurement vectors. Therefore, Claim 3 has been amended to refer to a "first next measurement vector" and a "second next measurement vector" to indicate that the next measurement vectors can be different in Claim 3. Accordingly, applicant respectfully submits that the meanings of these Claim 3 phrases have been clarified.

Further, regarding Claim 3, the Examiner states that the feature "the last measurement vector" at page 32, line 29, lacks antecedent basis. Claim 3 has been amended to replace "the last measurement vector" with "a last measurement vector". Accordingly, applicant respectfully submits that antecedent basis for the feature has been corrected.

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Further, regarding Claim 3, the Examiner states that the feature "the last measurement vector" at page 32, line 33, lacks antecedent basis. Claim 3 has been amended to replace "the last measurement vector" with "a last measurement vector". Accordingly, applicant respectfully submits that antecedent basis for the feature has been corrected.

Further, regarding Claim 3, the Examiner contends that it is unclear whether the phrase "a reference vector" at page 32, line 34, is intended to be the same as or different from the phrase "a reference vector" at page 30, line 23. The phrases are intended to refer to possibly different reference vectors. As set forth above, "reference vector" at page 30, line 23, has been amended to recite that it is one of the corresponding reference vectors that matches one of the received measurement vectors. Further, "reference vector" at page 32, line 34, corresponds to the second next measurement vector. These reference vectors can thus be different reference vectors. Element (e3) of Claim 3 has been amended to recite that the measurement vector is "the second next measurement vector" for providing further clarification. Accordingly, applicant respectfully submits that the meanings of these Claim 3 phrases have been clarified by the amendments.

Regarding Claim 9, the Examiner states that there is insufficient antecedent basis for the phrase "the maximum skew" at page 34, line 17. Claim 9 has been amended to replace the word "the" in the phrase with the word "a". Thus, antecedent basis for the phrase has been corrected.

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Further, regarding Claim 9, the Examiner contends that it is unclear whether the phrase "a relative skew" at page 34, line 20, is intended to be the same as or different from the phrase "a relative skew" at page 30, line 26. The phrases are intended to refer to possibly different next measurement vectors. Therefore, Claim 9 has been amended to refer to a "first relative skew" and a "second relative skew" to indicate that the relative skews can be different in Claim 9. Accordingly, applicant respectfully submits that the meanings of these Claim 9 phrases have been clarified.

Accordingly, in view of the above amendments and remarks, applicant respectfully submits that the rejection of Claims 1-13 under 35 U.S.C. § 112, second paragraph, should be withdrawn.

III. Claim Rejections Under 35 U.S.C. § 103

Claims 1 and 4-13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,031,847 to Collins et al. (hereafter, "Collins") in view of U.S. Patent No. 6,820,234 to Deas et al. (hereinafter, "Deas"). This rejection is respectfully traversed.

Claim 1 recites a method for measuring and compensating skews of data transmission lines connecting at least one data transmission device with a data reception device via a parallel bus. Further, Claim 1 recites that the method comprises measuring a relative time delay of a data transmission line by transmitting a determined sequence of measurement vectors each consisting of an alternating bit pattern via said data transmission line. A bit alternation frequency is halved with

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every transmitted measurement vector. Claim 1 also recites that the method comprises comparing received measurement vectors transmitted via said data transmission line with corresponding reference vectors stored in a data reception device. Further, Claim 1 recites that the method comprises shifting the received measurement vectors by inserting data unit intervals until one of the received measurement vectors matches one of the corresponding reference vectors. Claim 1 also recites that the method comprises calculating a relative skew of the data transmission line depending on the number of inserted data unit intervals with respect to a slowest data transmission line. Further, Claim 1 recites that the method comprises compensating the calculated relative skew of the data transmission line by means of delay elements switched in response to the calculated relative skew. Applicant respectfully submits that Collins and Deas, either alone or in combination, fail to teach or suggest each and every feature required by Claim 1.

Collins is directed to a method and system for deskewing parallel bus channels. Collins discloses a skew compensation circuit comprising a delay stack structure implemented in a receiver. The receiver is coupled to a transmitter via a plurality of channels. The delay stack structure includes a plurality of delay stacks, each coupled to a respective channel input of the receiver. Each delay stack selects a delay amount for the channel input it is coupled to. This is done to equal individual arrival times of bits transferred over the various channels and received by the receiver. The delay amount selected by the delay stacks is such that the total amount of delay of each channel plus its respective delay stack for each of the bits is

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substantially the same. (See column 8, lines 4-7, of Collins). To determine the amount of delay to add in the delay stacks, the delay stacks periodically measures the amount of skew present. This is accomplished through the use of a special "ping" sequence which is incorporated in a training micropacket. This training micropacket comprises a training detect sequence, a flush sequence, and the ping sequence. (See Figure 7, of Collins). The training detect sequence alerts a controller that the present micropacket is a training micropacket. The flush sequence flushes the delay lines of the respective delay stacks with logical zeros. Finally, the ping sequence comprises a number of logical ones which are sent down each of the channels and into the respective delay stacks. (See column 10, line 57, to column 11, line 24, of Collins). According to the teachings of Collins, the propagation of the ping sequence through each of the delay stacks is utilized to determine the relative skew for each channel, and hence, the proper amount of delay to add. Each delay stack comprises a number of latches which are opened and closed by the controller. The latches are coupled to respective delay lines of the delay stack. In the delay stack just prior to the arrival of the ping sequence, the controller opens the latches. Subsequently, as the ping sequence propagates through successive taps of the delay stack, its passing is registered in the latches coupled to the outputs of each respective tap. Once the ping sequence on the slowest of the channels has entered its respective delay line, the latches are closed. A ripple decoder analyzes the outputs of the latches to determine the progress of the ping sequence. The furthest

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tap through which the ping sequence rippled indicates the amount of delay to be added. (See column 9, line 15, to column 10, line 2, of Collins).

The Examiner refers to various portions of Collins as showing some of the features of Claim 1. (See page 4, of the Official Action). Applicant respectfully submits that the cited portions of Collins fails to teach or suggest the measuring of skews as required by Claim 1. Rather, these portions of Collins refer to the normal operation where the specific delays for data transmission lines have already been determined. More particularly, applicant respectfully submits that Collins fails to disclose or suggest the element (c), Claim 1 feature of "shifting the received measurement vectors by inserting data unit intervals until one of the received measurement vectors matches one of the corresponding reference vectors". Applicant respectfully submits that nowhere does Collins teach or suggest the features of element (c) of Claim 1.

Further, Collins fails to teach or suggest that a relative skew of data transmission is calculated depending on the number of inserted data unit intervals, as required by element (d) of Claim 1. Rather, Collins teaches that the skew is determined by opening and closing latches and determining the furthest tap through which the ping sequence rippled. Applicant respectfully submits that nowhere does Collins teach or suggest the features of element (d) of Claim 1.

Further, as set forth by the Examiner, Collins fails to teach or suggest transmitting a determined sequence of measurement vectors that each consist of an alternating bit pattern, where the bit alternation frequency is halved with every

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transmitted measurement vector and where the bit the received measurement vectors are compared with corresponding reference vectors stored in the reception device. These features are included in Claim 1. The Examiner contends that Deas discloses these features. Applicant respectfully disagrees for the reasons set forth below.

Deas fails to overcome the significant shortcomings of Collins. Deas discloses a communication apparatus comprising a plurality of driving registers for outputting signals from a transmitter for transferring the output signals over at least one communication line. The communication apparatus also comprises a plurality of receiving registers for latching the transferred signals. The driving registers and the receiving registers are calibrated by using phase shift means associated with the registers. The phase shift means might be programmable delays for delaying the signal with respect to a clock. By calibrating the registers, a skew is measured and compensated by means of programmable delays. These programmable delays are characterized by the linear dependence of the delay value on a code that is sent to the delay. According to Deas, the delays are calibrated by varying the calibration frequency while keeping other variable constant. This makes it possible to determine the threshold of the variable delay by fixing the difference in time of two transition moments. (See column 9, lines 9-12, of Deas). The communication apparatus is used by automatic test equipment for semiconductor device testing.

Applicant respectfully submits that Deas fails to disclose the Claim 1 features of elements (c) and (d) that are described above as not disclosed or suggested by

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Collins. Further, applicant respectfully submits that Deas fails to suggest these features. Therefore, for this reason alone, Collins and Deas, either alone or in combination, fail to teach or suggest each and every feature required by Claim 1.

Further, the Examiner contends column 14, lines 1-8, and column 21, line 51, to column 22, line 23, of Deas describe transmitting a determined sequence of measurement vectors that each consist of an alternating bit pattern, where the bit alternation frequency is halved with every transmitted measurement vector and where the bit the received measurement vectors are compared with corresponding reference vectors stored in the reception device. Applicant respectfully submits that these features are not taught or suggested by Deas.

Column 14, lines 1-8, of Deas discloses a phase shift means for matching the input timing of multiple test signal patterns. Further, this portion of Deas teaches that data read from a device under test (DUT) is compared by a fault logic means within a receiver (i.e., the test equipment). Therefore, this comparison described by Deas has nothing to do with the measuring of a skew of a data transmission line, as required by Claim 1. Particularly, applicant respectfully submits that Deas fails to disclose or suggest the feature of measurement vectors consisting of an alternating bit pattern, as required by Claim 1. Further, applicant respectfully submits that Deas fails to disclose or suggest the feature of halving of the bit alteration frequency with every transmitted measurement vector, as required by Claim 1.

For the reasons set forth above, applicant respectfully submits that Collins and Deas, either alone or in combination, fail to disclose or suggest each and every

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feature required by Claim 1. Therefore, it is respectfully submitted that Claim 1 should be allowed and the rejection under 35 U.S.C. § 103(a) withdrawn.

Claims 2-13 depend from Claim 1. Therefore, the comments presented above relating to Claim 1 apply equally to Claims 2-13. Accordingly, applicant respectfully submits that Claims 2-13 should be allowed and the rejection under 35 U.S.C. § 103(a) withdrawn for the same reasons provided above for Claim 1.

CONCLUSION

In light of the above amendments and remarks, it is respectfully submitted that the present application is now in proper condition for allowance, and an early notice to such effect is earnestly solicited.

If any small matter should remain outstanding after the Patent Examiner has had an opportunity to review the above Remarks, the Patent Examiner is respectfully requested to telephone the undersigned patent attorney in order to resolve these matters and avoid the issuance of another Official Action.

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DEPOSIT ACCOUNT

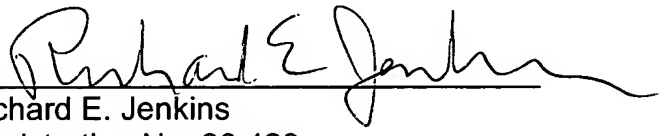
A check in the amount of \$1,020.00 is enclosed. The Commissioner is hereby authorized to charge any other fees associated with the filing of this correspondence to Deposit Account No. 50-0426.

Respectfully submitted,

JENKINS, WILSON, TAYLOR & HUNT, P.A.

Date: February 16, 2007

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